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# United States Army Health Care Studies



and

Clinical Investigation Activity

AMBULATORY CARE DATA BASE:

**EXECUTIVE SUMMARY** 

LTC T. R. Misener Mrs. P. M. Gilbert

FINAL REPORT #83-009

PART A

**MARCH 1984** 

HEALTH SERVICES COM FORT SAM HOUSTON, TEXAS 78234

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Active Army, Medical, Management, Decision, Policy, Evaluation					
ABSTRACT (Continue on reverse at the Nr necessary and identify by block number) As part of the FY 83 AMEDD Study Program, the Surgeon General of The Army					
tasked the Health Care Studies & Clinical Investigation Activity (HCSCIA) to investigate the need for an Ambulatory Care Data Base (ACDB). The study proposed to answer two questions: (1) Is it possible to capture the necessary information for an ambulatory data base (will health care providers complete encounter forms in addition to entries they are required to make in the					
outpatient medical record), and(2) What types of reports can be generated from the data gathered. A six month project was conducted at Fox Army Hospital,					

Redstone Arsenal, Alabama (this MIF met the requirement of separate occupationalhealth, troop, and outpatient clinics). The 10,000 - 13,000 patients seen each month, clerical staff, and primary care providers assisted in completing a "Mark Sense" data capture form using the National Computer Systems (NCS) Sentry 7001 Table-Top Optical Mark Sense Reader (OMR). After consultation with other health care providers, a two-sided, single sheet, multicolored form (purple and red) was designed to be different from any existing military forms. Major elements on the form were: demographic data (including occupational), provider identification, physical examinations, procedures performed, eligibility for care, referrals, disposition to include whether the diagnosis was job related, and diagnostic data. The international classification of health problems in primary care (ICHPPC-2) codes were used; the encounter form allowed space for only 250 of a possible 371 diagnoses. However, additional diagnoses could be found in a preprinted index and entered in spaces provided. Actual data collection began on 1 Nov 82. With approximately 60,000 records in the database, it has been demonstrated that personnel will complete the encounter forms. Three major categories of reports can be generated: 1) provider profile reports, 2) reports useful to management, e.g., MED 302, and 3) special reports not generated on a recurring basis.

CONCLUSIONS: The overall objectives of the study have been met: 1) the elements to be collected for an ambulatory care database have been identified. A significant number could be standardized across MTFS, however, the need for site-specific variables is recognized; 2) the majority of care providers will complete their portion of the encounter form, 3) a single encounter form for all clinics is not acceptable; 4) data collected can be audited and provide an objective and valid ambulatory peer review and quality assurance mechanism, 5) provider and clerical staff satisfaction was surveyed, 6) comparison of encounters from the ACDB and the MED 302 was accomplished; 7) the number of reports that can be developed from the data are limited only by the users imagination. The MED 302 can be captured from the data elements, 8) the OMR method of data capture was shown to be efficient and cost effective, 9, problems needing resolution in future use of an ACDB were indentified, 10) the need for command emphasis, at the highest levels, is obvious.

RECOMMENDATIONS: Recommend that this inexpensive and reliable data collection methodology be tested at more sites for eventual implementation. Even if an ambulatory care database is not developed, it provides an efficient, reliable, and low labor intensive method to capture data which are needed by the Army. The use of the discussed method is highly practical because it will interface with any system or mainframe conceptualized or planned at this time. It provides an excellent interim system until the Composite Health Care System (CHCS) is implemented. Finally, it can continue to be used in areas where a CHCS is not practical or planned, e.g., a field environment.

EXECUTIVE SUMMARY

Ambulatory Care Database Study (Report #83-009 Part A)



A-1

#### 1. INTRODUCTION.

# a. Purpose.

Recognizing the need for an Ambulatory Care Database (ACDB), The Army Surgeon General tasked the Health Care Studies Division (HCSD), Health Care Studies & Clinical Investigation Activity (HCSCIA), to examine the feasibility of implementing such a study. The study proposed to answer two questions:

- (1) Is it possible to capture the necessary information for an ambulatory database? (i.e., will health care providers complete encounter forms in addition to entries they are required to make in the outpatient medical record).
  - (2) What types of reports can be generated from the data gathered?
  - b. Background.

Although reports to document Army outpatient workload are generated on a recurring basis the reliability of the data and their usefulness has been questioned. The outpatient's individual health record contains routine information expected in any outpatient treatment setting. However, obtaining aggregate data, auditing a random set of outpatient records, documenting individual health care providers' practice profiles, or carrying out epidemiological research, has not been possible. A literature search was conducted to include a review of the development of standardized diagnostic codes, data systems, methods of data collection, and medical information management.

#### 2. LIMITATIONS.

- a. Resource constraints included both time and personnel. The data collection phase of the study was to be completed by the end of the 3D OTR FY 83. No full-time employees could be added for the study, i.e., required personnel were within the HCSD, the MEDDAC where the study was to be carried out, and from shared data processing staff.
- b. Prior studies demonstrated that the data gathering tool needed to be provider centered. Any table look-ups required by the provider should be kept to a minimum, and providers must feel the project to be symbiotic, i.e., they would gain something in return for their efforts. To be most effective, the data encounter form was not to exceed one page  $(8 \frac{1}{2} \times 11)$ .

## 3. METHODOLOGY.

## a. Overview.

(1) A six month project was undertaken to collect outpatient encounter information (including demographic data, workload, and diagnoses) at Fox Army Hospital, Redstone Arsenal, Huntsville, Alabama (1 Nov 82 - 31 Mar 83). The 10,000 - 13,000 patients seen each month, the clerical staff, and primary care providers all assisted in completing a "mark sense" data capture form.

- (2) The hardware selected was the National Computer Systems (NCS) Sentry 7001 Table-Top Optical Mark Sense Reader, with tape drive and transport printer attached. This equipment was compatible with hardware existing within HSC. NCS forms with an individual lithocode printed on each form facilitated merging/finding records easily. NCS was the only vendor known to provide this feature.
- (3) A two-sided, single page, multicolor (purple and red) encounter form was designed (see Appendix 1). The face validity of the form was assured by the investigators after consultation with other health care providers, public health professionals, and providers at Redstone.
- (4) Overall Army needs mandated that diagnostic information be a priority element in the database. The International Classification of Health Problems in Primary Care (ICHPPC-2) was selected (truncations of the ICD-9 classification. The codes were simple to use, and had previously been utilized in the Army Family Practice Database. The encounter form allowed space for only 250 of the possible 371 diagnoses. The remaining diagnoses not on the menu could be found in a preprinted index and then entered in spaces provided. Along with the demographics, the diagnostic information provides the core of the epidemiological data. These same data gave the MEDDAC the ability to carry out peer review and retrospective chart audits in a reliable and objective manner.

#### b. Procedures.

- (1) After a one day pilot test of the instrument at Fort Hood, Texas, minor form design and instruction sheet changes were made. A major change, suggested and incorporated, was to request able patients to complete their portion of the form. Staff training at Redstone began two weeks prior to the collection of data.
- (2) Prior to the implementation of the study, code numbers were assigned to each care provider and each clinic. Separate instruction sheets were prepared for patients, clerical staff, and care providers.
- (3) Patients were instructed to complete their portion of the demographic-type data which was checked for completeness and accuracy by the clerical staff who entered the clinic identifier, family member prefix (to identify household status of the patient), appointment status, and time in. The remainder of the form was completed by the providers. The clerical staff monitored completeness and entered the time out of the clinic. The provider had to select one of 371 diagnostic codes as the primary reason for seeing a patient on a particular visit. Additionally, the providers were allowed to select up to five secondary diagnoses germane to a particular visit (a secondary diagnosis was not required).
- (4) The patient portion of the form required about two minutes to complete; the provider data required about 30 seconds (after providers became familiar with frequently used diagnoses). Clerical staff required about 30 seconds to check and complete each form. After the encounter forms were completed

and checked for errors in the clinic, they were taken to a central point in the Administrative Department of the MEDDAC, where one of three trained persons processed the records. Error-free and corrected forms were read by the scanner and output onto seven inch magnetic tape. Tapes were transferred to Fort Sam Houston, Texas, for processing, analysis, and report generation.

#### 4. FINDINGS.

a. The major study question was: will providers complete the encounter forms as requested? With approximately 60,000 records in the database, it has been demonstrated that personnel will complete the encounter forms. All primary provider visits included in the Medical Summary 302 Feeder Reports were counted in the study. Visits to physicians accounted for 53% of the total encounters; 47% were credited to other providers (Figure 1).

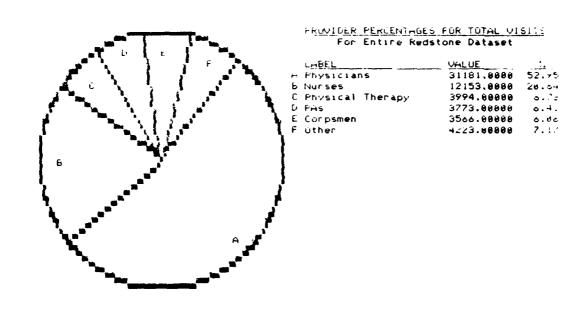


Figure 1

b. The second study question was: what reports can be generated from the acquired data? Reports can be partitioned into three major categories: 1) provider profiles, 2) reports useful to management, and 3) special reports not generated on a recurring basis. The number of reports possible are limited only by the user's imagination.

# 5. DISCUSSION.

- a. Primary care providers received profile reports of their practice on a monthly basis. The report included the following information:
  - a list and frequency of all primary diagnoses procedures reported patient demographic data beneficiary status of patients number and types of physical examinations average time patients spent in the clinic.
- b. Monthly aggregate reports useful to management were prepared and included:

number of patients seen in each clinic number of forms completed by each provider information for the Medical Summary Report MED 302 Service Branch Total MED 302 Service Branch Total/OH and TMC number of exams chaperoned per clinic students from other countries.

- c. Twenty diagnostic groups accounted for 77.9% of the diagnoses made during November, 75.4% in December, 76.6% in February, 78.9% in March, and 77.1% of the total diagnoses.
- d. To address reliability of data captured, the investigators randomly selected 30 encounter forms and compared the entries against the outpatient charts for the same encounter. The information on the encounter forms compared identically in 100% of the cases.
- e. A major concern of the hospital staff was fear that the total encounters reflected by the study would be fewer than the MCCU based on the Medical Summary 302 count. If the MEDDAC were to use the encounter system to replace all Medical Summary 302 feeder reports, would the activity be penalized? During the training phase this concern was alleviated, when one clinic, which had counted 78 patient encounters on the MED 302 feeder report the previous day, ran their encounter forms and found 120 encounters documented, an increase of 54%. A major strength of the encounter system is that the counts or visits are completely auditable; i.e., charts can be pulled to compare encounter forms to actual patient visits. This information is more difficult to extract from Medical Summary 302 feeder reports.
- f. Near the end of the study period, care providers and clerical personnel participated in a survey to measure their opinions of the encounter form and suggestions (additions/deletions) to increase its effectiveness. Twenty percent of the care providers indicated they would like to receive the practice profile report on a continuing basis. When asked if use of the form should be adopted Army-wide, 21% said yes because they felt the form would give good

estimates of workload; 68% said no, their reasons focused on additional time spent in filling out the form, which caused them to see two to four less patients per day; 11% had no opinion. (Arguments regarding fewer patients seen were felt to be artifacts not validated by administrative data, i.e., clinic hours, backlogs, or number of patients seen, were not affected.) Forty-seven percent felt information gained by completing the form was of value to them, while 53% felt it was of no value; 58% felt it was of value to Fox Army Hospital and the Army while 26% felt it was not; and 16% had no opinion. Only 10% said they preferred not to use the form at all. Most receptionists responded that the form was easy to use and agreed that the elements were in the most logical sequence; 90% felt the form captured all information required for report generation such as the MED Summary Report 302.

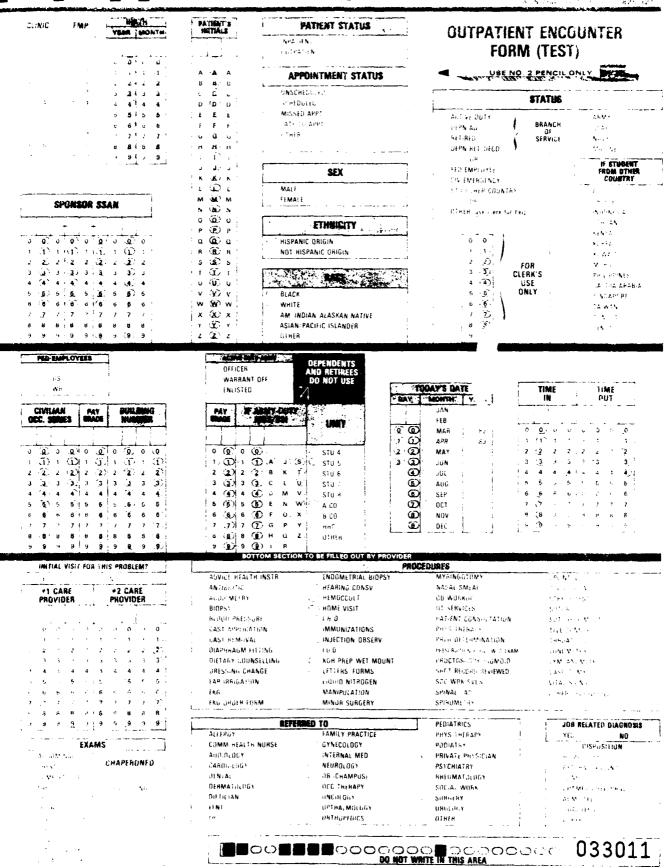
Several lessons have been learned from the study:

- (1) No one page form can meet the needs of every clinic. It is suggested that further study be undertaken to develop several forms for use by different specialties (e.g., pediatrics, obstetrics, occupational medicine, walk-in clinic, etc.).
- (2) Several providers found the ICHPPC-2 diagnostic codes to be too general for their needs. This may be a result of the physicians' experience with the ICD-9 codes for inpatient diagnoses. This area bears further exploration.
- (3) Time to fill out encounter forms would be greatly decreased if a registration system were developed to hold the patients' basic demographic data for call up.
- (4) The need for trained and dedicated personnel to manage the project and to process encounter forms is obvious. It is not envisioned that added personnel would be required, but that a realignment of duties may be necessar, as the system would greatly decrease the MED Summary 302 clerk's workload.
- 6. SUMMARY/CONCLUSIONS. The overall objectives of the study have been met.
- (1) The elements to be collected for an ambulatory care database were identified. A significant number could be standardized across MTFs, however, the need for site specific variables is recognized.
- (2) The majority of care providers will complete their portion of the encounter form.
  - (3) A single encounter form for all clinics is not acceptable.
- (4) Data collected can be audited and provide an objective and valid ambulatory peer review and quality assurance mechanism.
  - (5) Provider and clerical staff satisfaction was surveyed.

- (6) A comparison of encounters from the ACDB and the MED Summary 302 was accomplished.
- (7) The number of reports that can be developed from the data are limited only by the users' imagination. The MED Summary 302 can be captured from the data elements.
- (8) The OMR method of data capture was shown to be efficient and cost effective.
  - (9) Problems needing resolution in future use of an ACDB were identified.
- (10) The need for command emphasis, at the highest levels, is obvious. Failure to fill out the form properly must be viewed as negatively as falsification of patient records.

## 7. RECOMMENDATION.

Recommend that this inexpensive and reliable data collection methodology be tested at more sites for eventual implementation. The method is highly practical because it will interface with any system or mainframe conceptualized or planned at this time. It provides an excellent interim system until the Composite Health Care System (CHCS) is implemented. Finally, it can continue to be used in areas where a CHCS is not practical or planned, e.g., a field environment.



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